

FCC Part 15

TEST REPORT

of

E.U.T. : **E passport reader**

Trade Name : N/A

Model Number : AXESS F1000; AXESS F800; AXESS F500

Prepared for

IRIS Corporation Berhad.

IRIS Smart Technology Complex, Technology Park Malaysia,
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Statement of Compliance

Applicant: IRIS Corporation Berhad.
Manufacturer: IRIS Corporation Berhad.
EUT Description: E passport reader
Model No.: AXESS F1000; AXESS F800; AXESS F500
Serial No.: N/A
Tested Power Supply: 120Vac, 60Hz
Date of Final Test: March. 13, 2007

Configuration of Measurements and Standards Used :

FCC Rules and Regulations Part 15 Subpart B & C

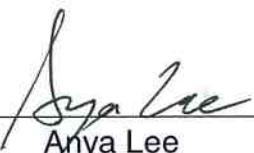
I HEREBY CERTIFY THAT: The data shown in this report were made in accordance with the procedures given in ANSI C63.4, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Note: 1. The result of the testing report relate only to the item tested.

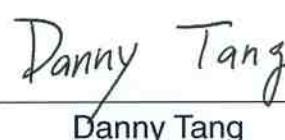
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Report Issued: 2007/11/12

Test Engineer:


Anya Lee

Checked:


Danny Tang

Approved:

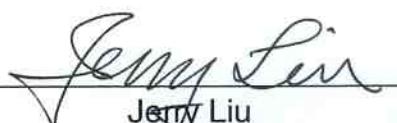

Jenny Liu

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1 General Information

1.1 Description of Equipment Under Test

Equipment Under Test : E passport reader

Model Number : AXESS F1000; AXESS F800; AXESS F500

Serial Number : N/A

Type of Sample Tested : Proto-type Pre-Production Mass Production

Applicant : **IRIS Corporation Berhad.**

IRIS Smart Technology Complex, Technology Park Malaysia, Bukit Jalil, 57000 Kuala Lumpur, Malaysia.

Manufacturer : **IRIS Corporation Berhad.**

IRIS Smart Technology Complex, Technology Park Malaysia, Bukit Jalil, 57000 Kuala Lumpur, Malaysia.

Power Adapter : From PC (5Vdc)

Date of Receipt Sample : Jan. 17, 2007

Date of Test : Jan. 18, 2007 ~March. 13, 2007

Description of E.U.T. : 1) The EUT is **E passport reader**.

2) **Interface / Port:**

USB Port *1

Data Cable:

USB Cable: Shielded Detachable, 1.8m w/o core

- 3) The Model Number “**AXESS F1000**” is representative selected in the test and included in this report.
- 4) See the below table for the difference of all model included in this report.

Model No.	Function
AXESS F1000	1) To read electronic passport in E passport Slot. 2) OCR Slot is only used when attempting to read BAC protected E-Passports.
AXESS F800	To read electronic passport in E passport Slot.
AXESS F500	To read Mifare card in the reader Slot.
Remark: The difference for series models AXESS F800 & AXESS F500 only the application program for customer, the rest parts are identical.	

1.2 Technical Specifications

Frequency Range	:	13.56MHz
Antenna type	:	One turn compensated
Modulation	:	PCD to PICC: ASK100% for Type A, ASK 8~14% for Type B PICC to PCD: OOK (106kbps), BPSK (212kbps and above) for Type A. BPSK for Type B
Channel Number	:	1
Interface	:	USB2.0 full speed compliant (12Mbps)
Full size ID1 slot	:	*1
SAM slot	:	*4
Supply voltage	:	5V DC (from USB port)
Supply current	:	Approx. 400mA
Card connector	:	Landing Type
Card insertion cycles	:	Min. 500K
Operating temperature	:	0-50 degree celcius

1.3 Table for Carrier Frequencies

Channel	Frequency
1	13.56 MHz

1.4 Tested Supporting System Detail

1.4.1 Personal Computer

PC18

Model Number : IBM ThinkCentre 8175-OVE
Serial Number : 99LBVYC
CPU Speed : Pentium 4 Celeron D 2.8 Ghz
EMC Approved : CE, FCC, C-Tick, UL, BSMI: R33026
Manufacturer : IBM
RAM : 256M*1
Hard Disk Driver : 80GB

1.4.2 Monitor

MT20

Model Number : L1955
Serial Number : CNK5180YG5
EMC Approved : FCC, CE, BSMI:R33001,UL,TUV, VCCI, C-Tick, SAFETY
Manufacturer : HP
Data Cable : Shielded, Detachable, 1.2m

1.4.3 Modem

MD03

Model Number : 199450042
Serial Number : 211-28E1-1100-3
EMC Approved : N/A
Manufacturer : DATATRONICS
Data Cable : Shielded, Detachable, 1.5m
Power Adapter : Amigo, Model AM-12830A
Non-Shielded, Detachable, 1.8m

1.4.4 Mouse

MS25

Model Number : M-SBF83
Serial Number : HCA51802344
EMC Approved : UL, BSMI R41126
Manufacturer : Logitech
Data Cable : Shielded, Un-detachable, 1.8m

1.4.5 Printer

PR03

Model Number : C20SX
Serial Number : DW4Y045545
EMC Approved : BSMI 3902E004
Manufacturer : EPSON
Data Cable : Shielded, Detachable, 1.8m
Power Cord : Non-shielded, Un-detachable, 1.8m

1.4.6 Keyboard

KB18

Model Number : Y-SM48
Serial Number : SY506U67239
EMC Approved : FCC DoC, CE, C-Tick, BSMI T51160, VCCI
Manufacturer : LOGITECH
Data Cable : Shielded, Un-detachable, 1.5m

1.5 Test Facility

Site Description	: <input checked="" type="checkbox"/> OATS 2 <input checked="" type="checkbox"/> Conduction 2
Name of Firm	: Interocean EMC Technology Corp.
Company web	: http://www.ietc.com.tw
Site 1, 2 Location	: No.5-2, Lin 1, Tin-Fu Tsun, Lin-Kou Hsiang, Taipei County, Taiwan, R.O.C.
Site 3, 4 Location	: No. 12, Ruei-Shu Valley, Ruei-Ping Tsun, Lin-Kou Hsiang, Taipei County, Taiwan, R.O.C.
Site Filing	: <ul style="list-style-type: none">● Federal Communication Commissions – USA Registration No.: 96399 (OATS 1 & 2)● Registration No.: 518958 (OATS 3 & 4)● Voluntary Control Council for Interference by Information Technology Equipment (VCCI) – Japan Registration No. (Conducted Room): C-1094● Registration No. (Conducted Room): T-271● Registration No. (OATS 1): R-1040● Registration No. (OATS 2): R-1041● Industry Canada (IC) Submission: 113543● Japan Electrical Safety & Environment Technology Laboratories (JET) Registration No.: 04S03-01● Bureau of Standards and Metrology and Inspection (BSMI) – Taiwan, R.O.C. Accreditation No.:<ul style="list-style-type: none">SL2-IN-E-0026 for CNS13438 / CISPR22SL2-R1-E-0026 for CNS13439 / CISPR13SL2-R2-E-0026 for CNS13439 / CISPR13SL2-A1-E-0026 for CNS13783-1 / CISPR14-1● National Voluntary Laboratory Accreditation Program (NVLAP) - USA NVLAP LAB CODE 200458● Nemko AS Authorization No.: ELA 181A● Authorization No.: ELA 181B● Taiwan Accreditation Foundation (TAF) Accrditation No.: 1113
Site Accreditation	: <ul style="list-style-type: none">SL2-IN-E-0026 for CNS13438 / CISPR22SL2-R1-E-0026 for CNS13439 / CISPR13SL2-R2-E-0026 for CNS13439 / CISPR13SL2-A1-E-0026 for CNS13783-1 / CISPR14-1



2 PROVISIONS APPLICABLE.

2.1 Definition

Unintentional radiator:

A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:

A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device:

A digital device is marketed for use in a residential environment notwithstanding use in a commercial, business or industrial environment. Example of such devices that are marketed for the general public.

Note: A manufacturer may also qualify a device intended to be marketed in a commercial business or industrial environment as a Class B digital device, and in fact is encouraged to do so provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

Intentional radiator:

A device that intentionally generates and emits radio frequency energy by radiation or induction

2.2 Requirement for Compliance

(1) Conducted Emission Requirement

For intentional device, according to §15.207(a) Line Conducted Emission Limits is same as below table.

For unintentional device, according to CISPR Line Conducted Emission Limits class B is as following:

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 - 0.5	66-56	56-46
0.5 - 5.0	56	46
5.0 - 30.0	60	50

(2) Radiated Emission Requirement

For unintentional device, according to §15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance Meters (m)	Radiated (dB μ V/m)	Radiated (μ V/m)	CFR47 Part15
1.705-30.0	30	29.5	30	§15.209 (a)
30 - 88	3	40.0	100	§15.109 (a) §15.209 (a)
88 - 216	3	43.5	150	§15.109 (a) §15.209 (a)
216 - 960	3	46.0	200	§15.109 (a) §15.209 (a)
Above 960	3	54.0	500	§15.109 (a) §15.209 (a)

For intentional device, according to §15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

For unintentional device, according to CISPR Line Radiated Emission Limits class B is as following:

Frequency (MHz)	Distance Meters (m)	Radiated (dB μ V/m)
30 to 230	10	30
230 to 1000	10	37

(3) The field strength of EUT emissions within the band 13.553~13.567 MHz

Limit

Field strength (μ V/m)	Distance Meters (m)
15.848	30

(4) The frequency tolerance of the carrier signal

Limit: carrier frequency $\pm 0.01\%$

Temperature variation: $-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$; normal supply voltage

Variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20°C

2.3 Summary of Measurement

Report Clause	Test Parameter	Remarks	Reference Document	Test result
			CFR47 Part15	
4	Conducted Emission Requirement	Applicable	§15.207 (a)	PASSED
5	Radiated Emission Requirement	Applicable	§15.209 (a) §15.225 (d)	PASSED
6	The field strength of EUT emissions within the band 13.553~13.567 MHz	Applicable	§15.225 (a)	PASSED
7	The frequency tolerance of the carrier signal	Applicable	§15.225 (e)	PASSED

2.4 Restricted Bands of Operation

According to FCC Part15C §15.205 requirement.

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.25
0.495 - 0.505 **	16.69475 - 16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425 - 16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475 - 156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3360-4400	Above 38.6
13.36-13.41			

**: Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

2.5 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.6 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

3 SYSTEM TEST CONFIGURATION

3.1 Justification

For both radiated and conducted emissions below 1 GHz, the system was configured for testing in a typical fashion, as a customer would normally use it. The peripherals other than EUT were connected in normally standing by situation. Measurement was performed under the condition that a computer program was exercised to simulate data communication of EUT, and the transmission rate was set to maximum allowed by EUT. Three highest emissions were verified with varying placement of the transmitting antenna connected to EUT to maximize the emission from EUT.

For conducted emissions, only measured on operation, for the digital circuits portion also function normally whenever is operated. For radiated emissions, whichever RF channel is operated, the digital circuits function identically. As the reason, measurement of radiated emissions from digital circuits is only performed by operation mode.

During the preliminary test, the worse cases are operation mode, and data presented in this test report just shows the worse case.

4 Power Line Conducted Emission Measurement

4.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Last Calibration
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100135	2006/07/31
L.I.S.N.	Schwarzbeck	NNLK8121	8121417	2006/07/17
L.I.S.N.	Rohde & Schwarz	ESH3-Z5	100176	2006/02/16
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	843602/02	2006/09/11
RF Cable	HARBOUR	RG400	CBL04	2006/08/10

Note: All instrument upon which need to be calibrated are within calibration period of 1 year.

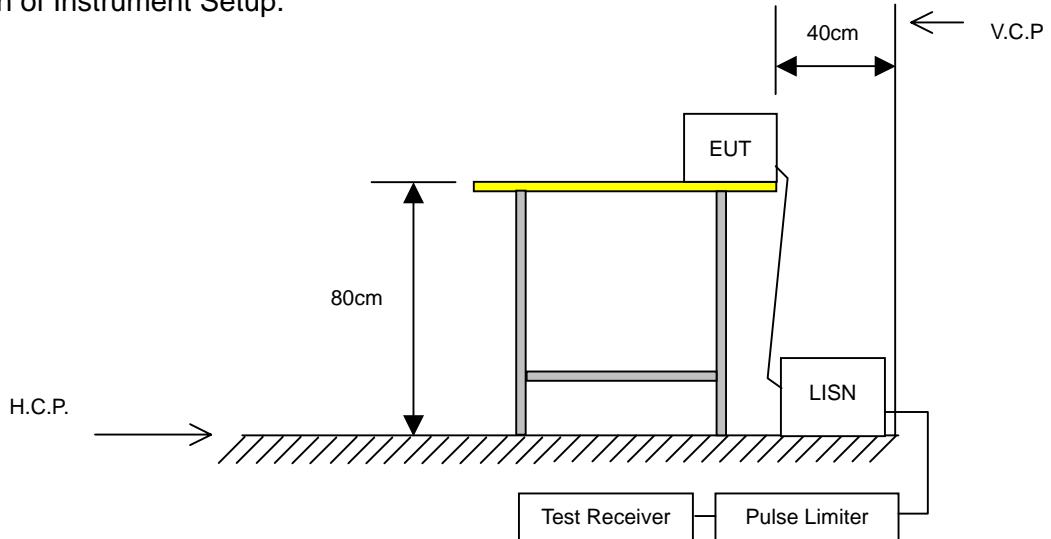
4.2 Standard Applicable and limit

For unintentional radiator, the radiated emission shall comply with §15.207(a) Line Conducted Emission

Frequency (MHz)	Conducted Limit (dB μ V)	
	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 ~ 0.50	66 to 56	56 to 46
0.50 ~ 5.0	56	46
5.0 ~ 30	60	50

4.3 Block Diagram of Test Configuration

Configuration of Instrument Setup.



4.4 Measurement Instrument setting

- 4.4.1 Set the EMI test receiver frequency range from 150 kHz to 30 MHz.
- 4.4.2 Set the EMI test receiver bandwidth at 9kHz.
- 4.4.3 Set the EMI test receiver detector as Quasi-Peak (Q.P.) and Average (AV).

4.5 Configuration of Measurement

- 4.5.1 The EUT was placed on a non-conductive table whose total height equaled 80cm and vertical conducting plane located 40cm to the rear of the EUT.
- 4.5.2 The EUT was connected to the main power through Line Impedance Stabilization Networks (LISN). This setup provided a 50ohm / 50 μ H coupling impedance for the measuring equipment. The auxiliary equipment was also connected to the main power through a LISN that provided a 50ohm/50 μ H coupling impedance with 50ohm termination. (Refer to the block diagram of the test setup and photographs.)
- 4.5.3 The conducted disturbance was measured between the phase lead and the reference ground, and between the neutral lead and reference ground. The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.
- 4.5.4 The identification of the frequency of highest disturbance with respect to the limit was found by investigating disturbances at a number of significant frequencies. The probable frequency of maximum disturbance had been found and that the associated cable and EUT configuration and mode of operation had been identified.

4.6 Test Step of EUT

- 4.6.1 Setup the EUT and peripheral as above.
- 4.6.2 Turn on the power of all equipment.
- 4.6.3 Boot up the PC from hard disk to Windows operation system.
- 4.6.4 The EUT was inserted to the USB port, which is located at the rear USB Port of the PC.
- 4.6.5 Execute Main.Bat Test program.
- 4.6.6 Check the EUT read card ok.
- 4.6.7 Start to test.

4.7 Test Result

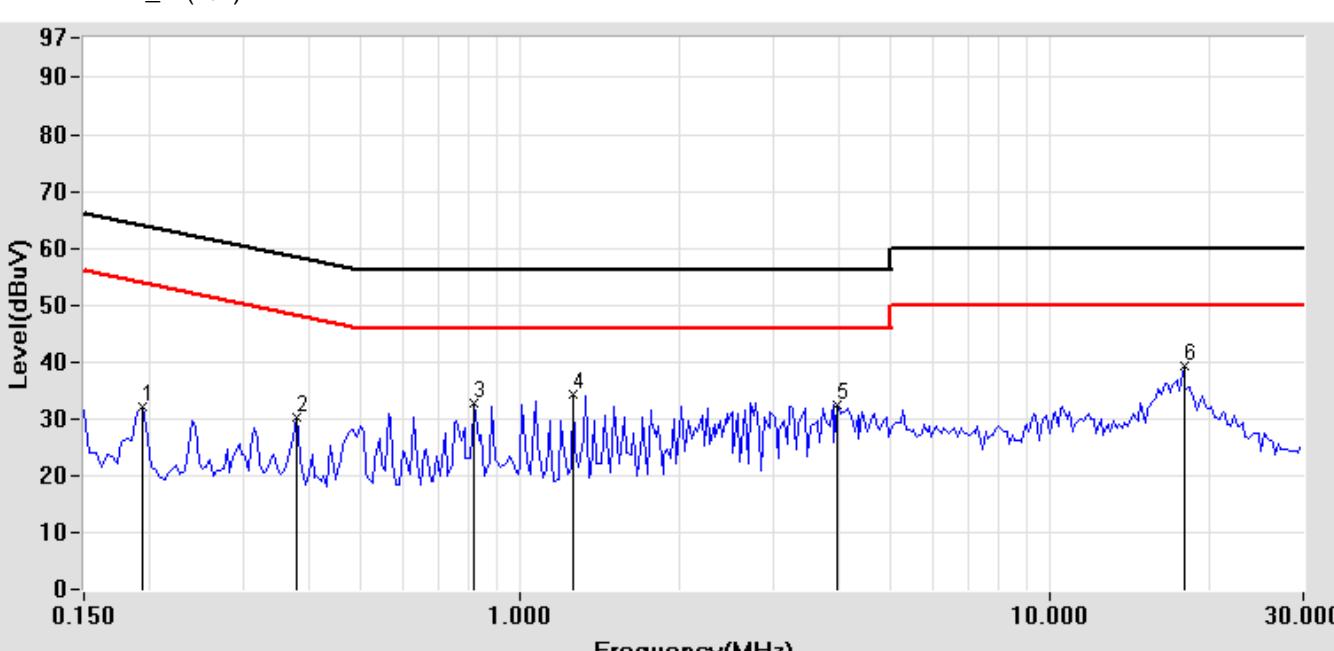
PASS.

The final test data is shown on following pages.

Power Line Conducted Test Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F1000 RATING: 120V/60Hz Temperature: 24.0 °C Humidity: 71 %				POLARITY: Line DISTANCE: Serial No.: FILE/DATA#:IRIS.emi/56 OPERATOR: KEN TEST SITE: Conduction2					
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)		Emission Level (dB μ V)		Limits (dB μ V)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.189	0.21	39.44	36.14	39.65	36.35	64.08	54.08	-24.43	-17.73
0.568	0.15	34.41	32.20	34.56	32.35	56.00	46.00	-21.44	-13.65
0.818	0.20	35.58	33.32	35.78	33.52	56.00	46.00	-20.22	-12.48
1.259	0.24	36.56	32.48	36.80	32.72	56.00	46.00	-19.20	-13.28
10.627	0.47	33.73	22.11	34.20	22.58	60.00	50.00	-25.80	-27.42
15.966	0.63	35.14	28.25	35.77	28.88	60.00	50.00	-24.23	-21.12
Remark: 1. All readings are Quasi-Peak and Average values. 2. Factor = Insertion Loss + Cable Loss.									
LIMIT: CIS22_B (QP).LMT									
Test Mode: Mode1: Working Mode									

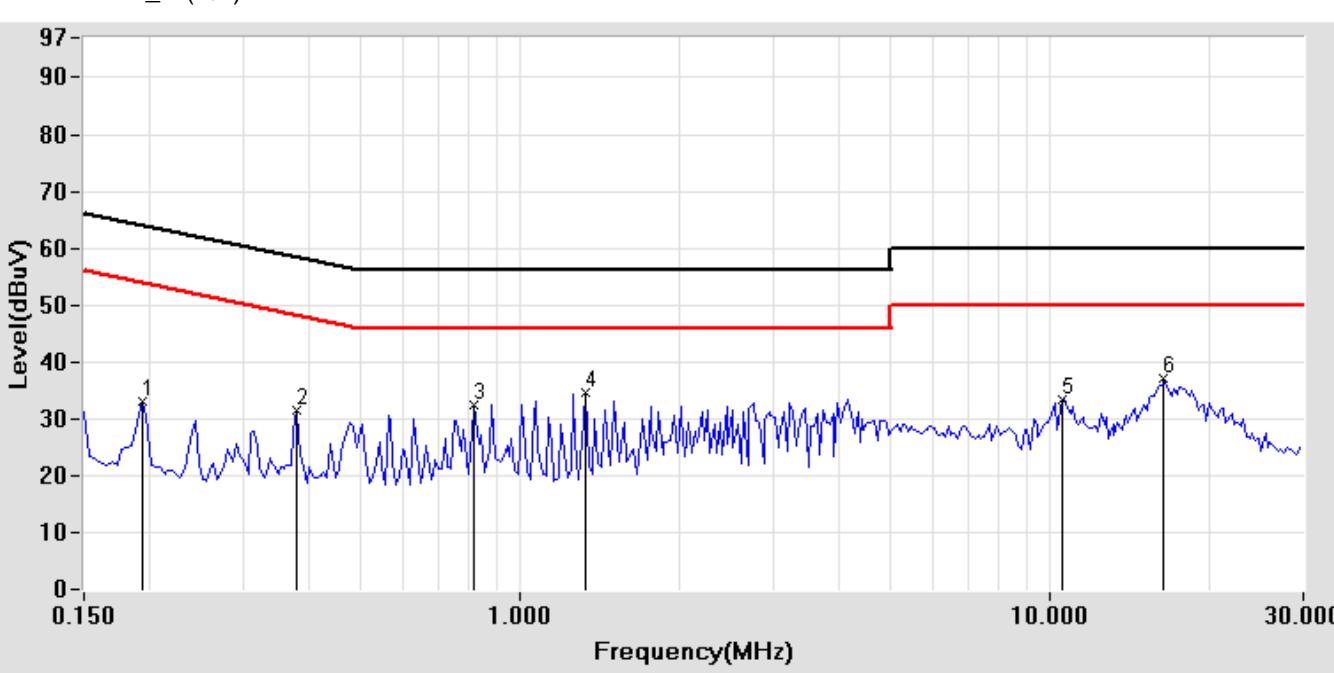
Power Line Conducted Test Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F1000 RATING: 120V/60Hz Temperature: 24.0 °C Humidity: 71 %				POLARITY: Neutral DISTANCE: Serial No.: FILE/DATA#:IRIS.emi/55 OPERATOR: KEN TEST SITE: Conduction2					
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)		Emission Level (dB μ V)		Limits (dB μ V)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.193	0.21	32.11	28.61	32.32	28.82	63.91	53.91	-31.59	-25.09
0.377	0.22	30.86	27.48	31.08	27.70	58.35	48.35	-27.27	-20.65
0.818	0.23	33.29	30.85	33.52	31.08	56.00	46.00	-22.48	-14.92
1.259	0.24	35.18	30.83	35.42	31.07	56.00	46.00	-20.58	-14.93
3.963	0.21	32.31	26.71	32.52	26.92	56.00	46.00	-23.48	-19.08
17.849	0.78	37.49	31.61	38.27	32.39	60.00	50.00	-21.73	-17.61
Remark: 1. All readings are Quasi-Peak and Average values. 2. Factor = Insertion Loss + Cable Loss.									
LIMIT: CIS22_B (QP).LMT									
									
Test Mode: Mode1: Working Mode									

Power Line Conducted Test Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F800 RATING: 120V/60Hz Temperature: 24.0 °C Humidity: 71 %				POLARITY: Line DISTANCE: Serial No.: FILE/DATA#:IRIS.emi/53 OPERATOR: KEN TEST SITE: Conduction2					
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)		Emission Level (dB μ V)		Limits (dB μ V)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.189	0.21	39.58	36.20	39.79	36.41	64.08	54.08	-24.29	-17.67
0.314	0.16	37.14	34.71	37.30	34.87	59.86	49.86	-22.56	-14.99
0.818	0.20	35.14	32.81	35.34	33.01	56.00	46.00	-20.66	-12.99
1.255	0.24	35.73	32.79	35.97	33.03	56.00	46.00	-20.03	-12.97
10.615	0.47	33.04	20.06	33.51	20.53	60.00	50.00	-26.49	-29.47
16.029	0.63	35.03	29.40	35.66	30.03	60.00	50.00	-24.34	-19.97
Remark: 1. All readings are Quasi-Peak and Average values. 2. Factor = Insertion Loss + Cable Loss.									
LIMIT: CIS22_B (QP).LMT									
Test Mode: Mode1: Working Mode									

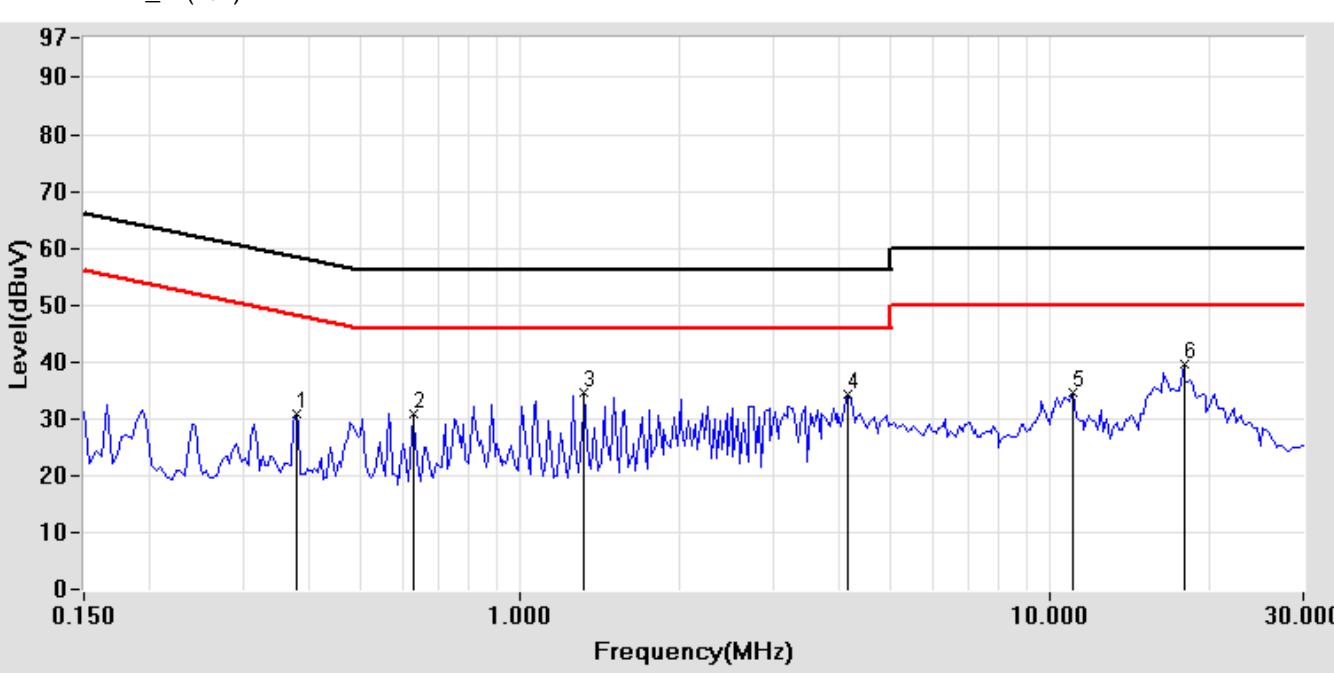
Power Line Conducted Test Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F800 RATING: 120V/60Hz Temperature: 24.0 °C Humidity: 71 %				POLARITY: Neutral DISTANCE: Serial No.: FILE/DATA#:IRIS.emi/54 OPERATOR: KEN TEST SITE: Conduction2					
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)		Emission Level (dB μ V)		Limits (dB μ V)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.193	0.21	32.11	28.69	32.32	28.90	63.91	53.91	-31.59	-25.01
0.377	0.22	30.80	27.57	31.02	27.79	58.35	48.35	-27.33	-20.56
0.818	0.23	32.99	30.51	33.22	30.74	56.00	46.00	-22.78	-15.26
1.322	0.24	34.24	29.00	34.48	29.24	56.00	46.00	-21.52	-16.76
10.490	0.56	32.78	21.14	33.34	21.70	60.00	50.00	-26.66	-28.30
16.388	0.69	36.33	31.05	37.02	31.74	60.00	50.00	-22.98	-18.26
Remark: 1. All readings are Quasi-Peak and Average values. 2. Factor = Insertion Loss + Cable Loss.									
LIMIT: CIS22_B (QP).LMT									
									
Test Mode: Mode1: Working Mode									

Power Line Conducted Test Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F500 RATING: 120V/60Hz Temperature: 24.0 °C Humidity: 71 %				POLARITY: Line DISTANCE: Serial No.: FILE/DATA#:IRIS.emi/52 OPERATOR: KEN TEST SITE: Conduction2					
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)		Emission Level (dB μ V)		Limits (dB μ V)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.189	0.21	39.58	36.20	39.79	36.41	64.08	54.08	-24.29	-17.67
0.377	0.13	36.58	33.82	36.71	33.95	58.35	48.35	-21.64	-14.40
0.818	0.20	35.03	32.76	35.23	32.96	56.00	46.00	-20.77	-13.04
1.255	0.24	35.79	32.88	36.03	33.12	56.00	46.00	-19.97	-12.88
10.486	0.47	32.78	19.91	33.25	20.38	60.00	50.00	-26.75	-29.62
16.388	0.64	36.81	31.31	37.45	31.95	60.00	50.00	-22.55	-18.05
Remark: 1. All readings are Quasi-Peak and Average values. 2. Factor = Insertion Loss + Cable Loss.									
LIMIT: CIS22_B (QP).LMT									
Test Mode: Mode1: Working Mode									

Power Line Conducted Test Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F500 RATING: 120V/60Hz Temperature: 24.0 °C Humidity: 71 %				POLARITY: Neutral DISTANCE: Serial No.: FILE/DATA#:IRIS.emi/51 OPERATOR: KEN TEST SITE: Conduction2					
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)		Emission Level (dB μ V)		Limits (dB μ V)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.377	0.22	30.97	27.57	31.19	27.79	58.35	48.35	-27.16	-20.56
0.627	0.23	30.37	27.95	30.60	28.18	56.00	46.00	-25.40	-17.82
1.318	0.24	34.72	30.54	34.96	30.78	56.00	46.00	-21.04	-15.22
4.142	0.22	34.55	29.32	34.77	29.54	56.00	46.00	-21.23	-16.46
11.045	0.56	31.17	21.49	31.73	22.05	60.00	50.00	-28.27	-27.95
17.849	0.78	38.00	31.23	38.78	32.01	60.00	50.00	-21.22	-17.99
Remark: 1. All readings are Quasi-Peak and Average values. 2. Factor = Insertion Loss + Cable Loss.									
LIMIT: CIS22_B (QP).LMT									
									
Test Mode: Mode1: Working Mode									

5 Radiated Emission Measurement

5.1 Instrument (For frequencies measured below 1 GHz)

Instrument	Manufacturer	Model	Serial No.	Last Calibration
EMI Test Receiver	Rohde & Schwarz	ESI7	830154/002	2006/08/09
Spectrum Analyzer	Agilent	8564EC	4046A00331	2006/03/27
Spectrum Analyzer	R&S	FSP30	100002	2006/11/14
Test Receiver	R&S	ESVS10	826148/011	2006/06/15
Bilog Antenna	Schaffner	CBL6112B	2811	2006/11/06
Preamplifier	Agilent	8449B	3008A01434	2006/04/10
Preamplifier	Agilent	8447D	2944A09703	2006/04/20
Loop Antenna	Schaffner	HLA6120	1171	2006/08/01

Note: All instrument upon which need to be calibrated are within calibration period of 1 year.

5.2 Standard Applicable and limit

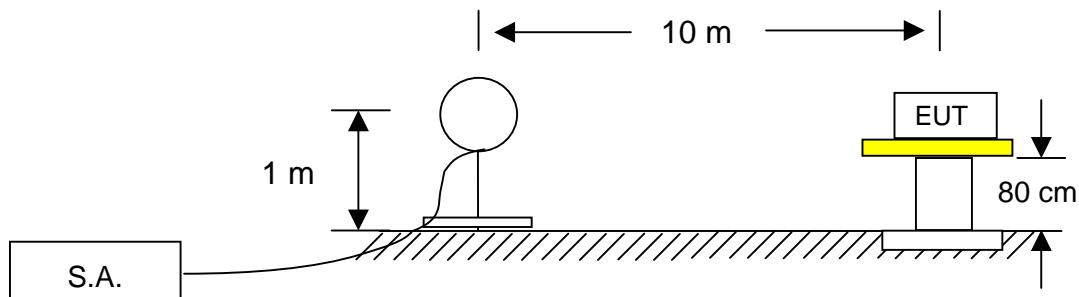
For intentional radiator, the radiated emission shall comply with §15.209(a).

Frequency (MHz)	Distance Meters (m)	Radiated (dB μ V/m)
1.705 to 30	10	48.626
	3	69.542

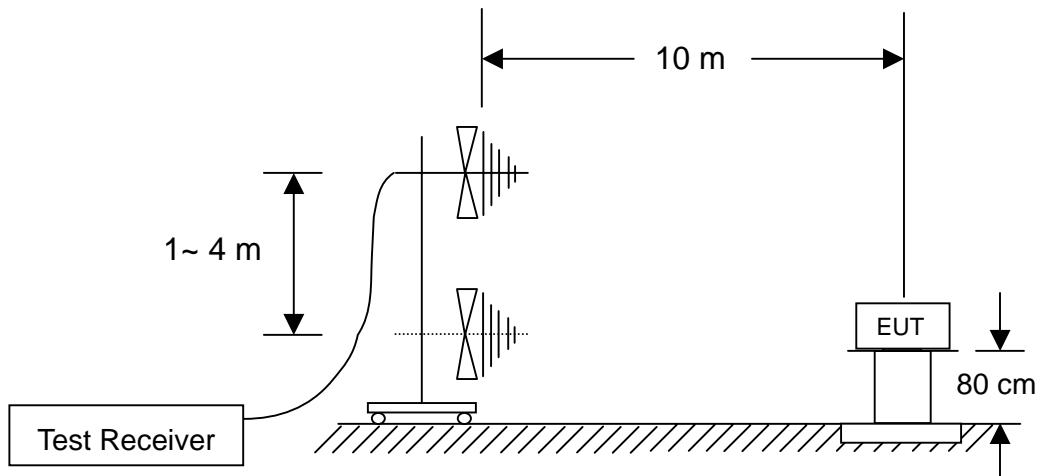
Frequency (MHz)	Distance Meters (m)	Radiated (dB μ V/m)
30 to 230	10	30
230 to 1000	10	37

5.3 Block Diagram of Test Configuration

Frequencies measured 0.009MHz ~ 30MHz configuration.



Frequencies measured 30MHz ~ 1 GHz configuration.



5.4 Measurement Instrument setting

- 5.4.1 Set the EMI test receiver frequency range from 9 kHz to 150 kHz.
- 5.4.2 Set the EMI test receiver bandwidth at 100 Hz.
- 5.4.3 Set the EMI test receiver detector as Quasi-Peak (Q.P.).
- 5.4.4 Set the EMI test receiver frequency range from 150 kHz to 30 MHz.
- 5.4.5 Set the EMI test receiver bandwidth at 9 kHz.
- 5.4.6 Set the EMI test receiver detector as Quasi-Peak (Q.P.).
- 5.4.7 Set the EMI test receiver frequency range from 30 MHz to 1000 MHz.
- 5.4.8 Set the EMI test receiver bandwidth at 120 kHz.
- 5.4.9 Set the EMI test receiver detector as Quasi-Peak (Q.P.).

5.5 Configuration of Measurement

Methods of measurement (9kHz~ 30MHz)

- 5.5.1 The field strength shall be measured for frequencies below 30 MHz. The equipment under test shall be measured at a distance of 10 m on an outdoor test site. The test antenna shall be a calibrated shielded magnetic field antenna.
- 5.5.2 The equipment under test shall be switched on with normal modulation. The characteristics of the modulation signal used shall be stated on the test report. The measuring receiver shall be tuned over the frequency range 9 kHz to 30 MHz, except for the frequency band on which the transmitter is intended to operate.
- 5.5.3 At each frequency at which a relevant spurious signal is detected the equipment under test and the test antenna shall be rotated until maximum field strength is indicated on the measuring receiver. This level shall be noted.

Methods of measurement (30MHz ~ 1 GHz)

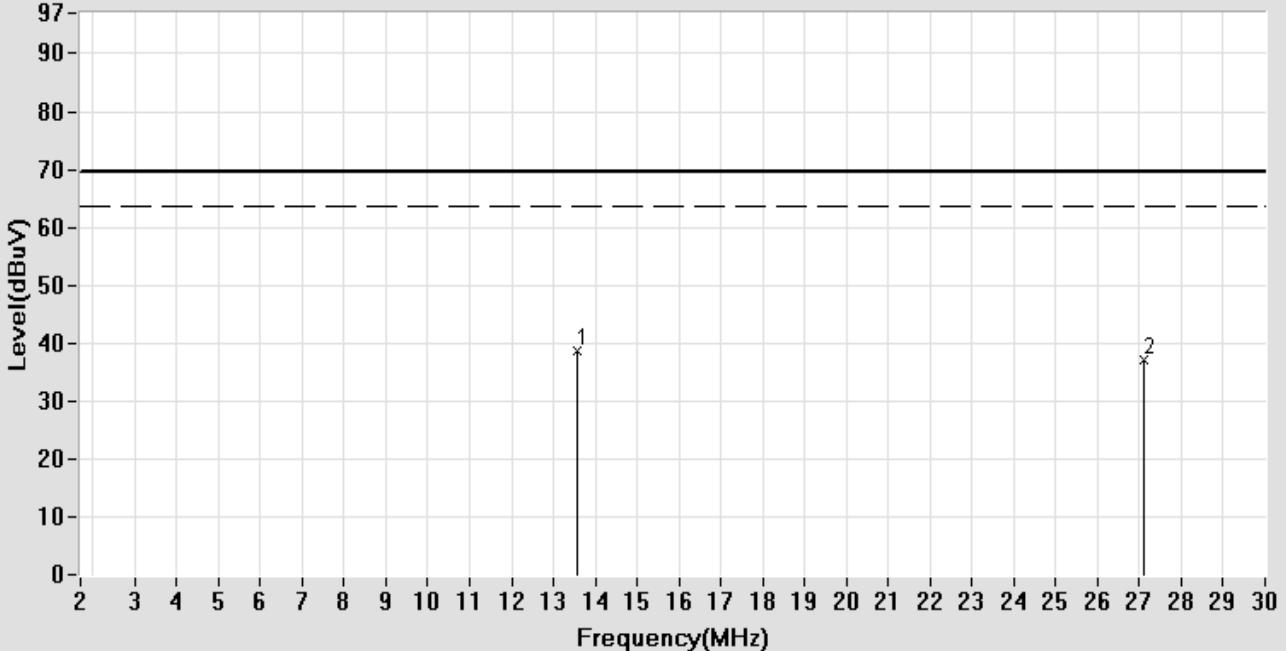
- 5.5.4 Setup the configuration per 5.1 for frequencies measured 30MHz to 1GHz respectively.
- 5.5.5 For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on an open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.
- 5.5.6 For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 5.5.5.
- 5.5.7 The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0° to 360° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.
- 5.5.8 Repeat step 5.5.7 until all frequencies need to be measured were complete.
- 5.5.9 Repeat step 5.5.8 with search antenna in vertical polarized orientations.
- 5.5.10 Check the three frequencies of highest emission with varying the placement of cables associated with EUT to obtain the worse case and record the result.

5.6 Test Result

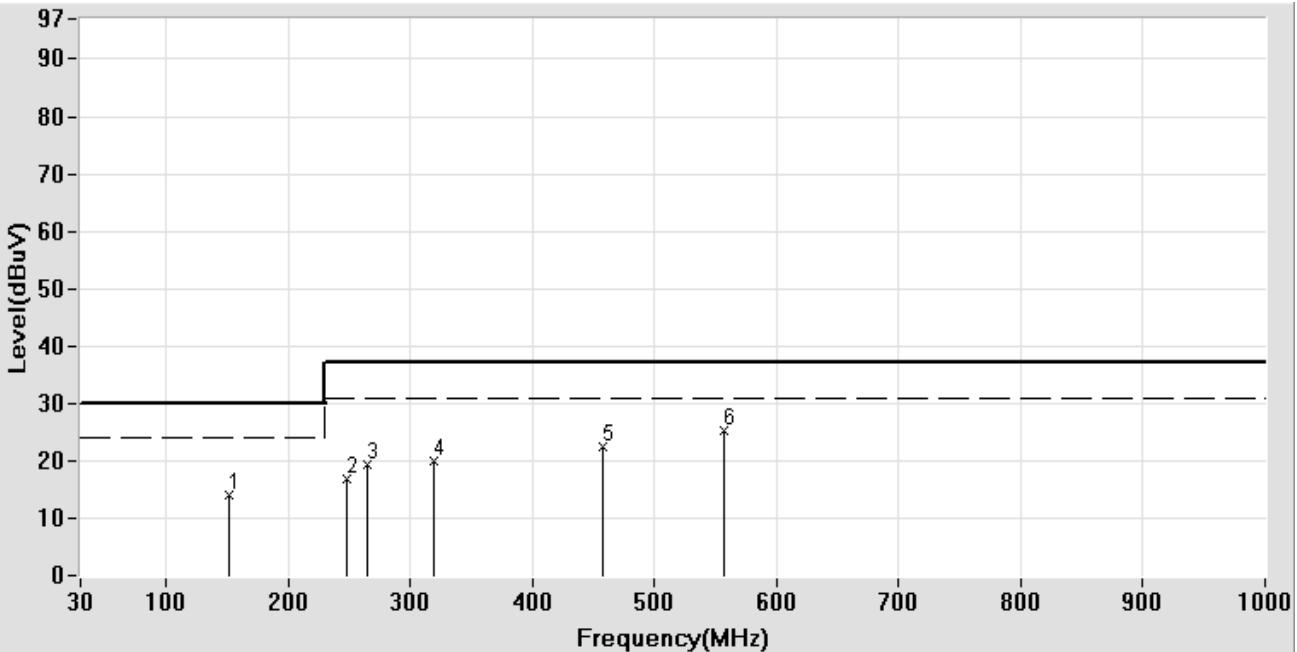
PASS.

The final tested data are shown on following pages.

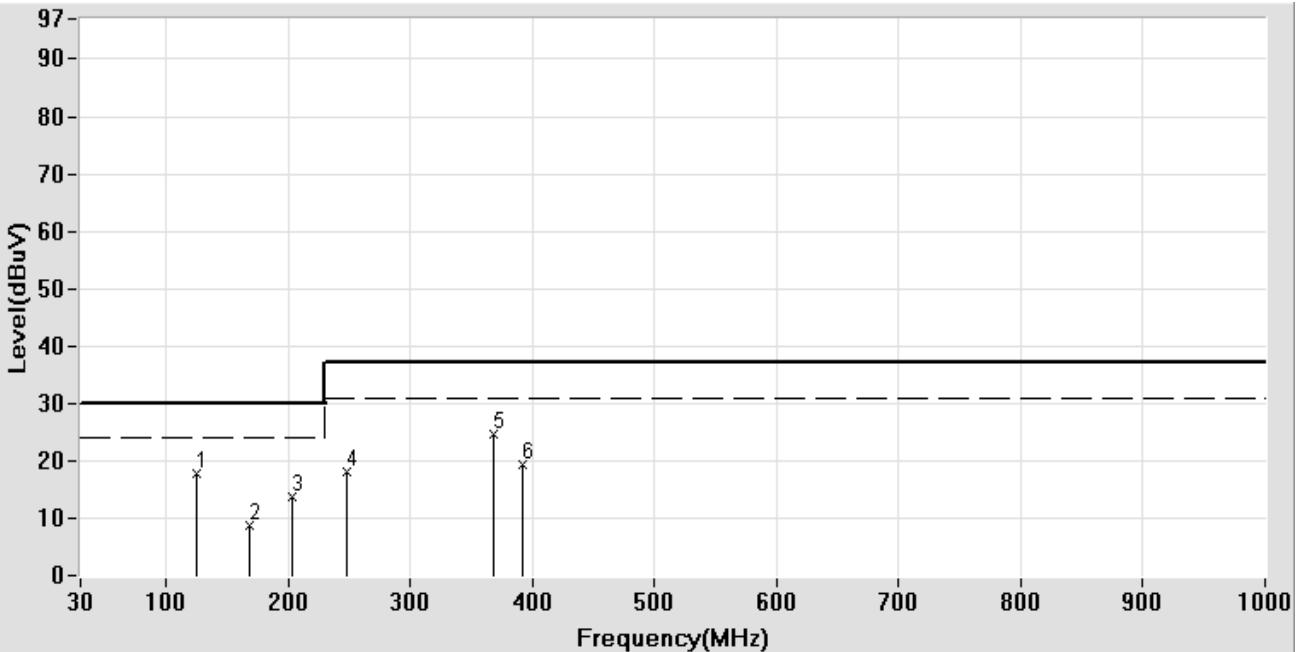
Radiated Emission Measurement Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F1000 RATING: 120V/60Hz Temperature: 16.6 °C Humidity: 58 %			POLARITY: Horizontal DISTANCE: 3 m Serial No.: FILE/DATA#:IRIS.emi/15 OPERATOR: KEN TEST SITE: OAST2		
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
13.560 **	9.25	29.54	38.79	69.50	-30.71
27.120 **	9.14	27.95	37.09	69.50	-32.41
Remark: 1. “*” Mark means readings are Peak Values. 2. “**” Mark means readings are Quasi-Peak values. 3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.					
LIMIT: FCC ID 1.705-30m.LMT					
					
Test Mode: Mode1: Working Mode					

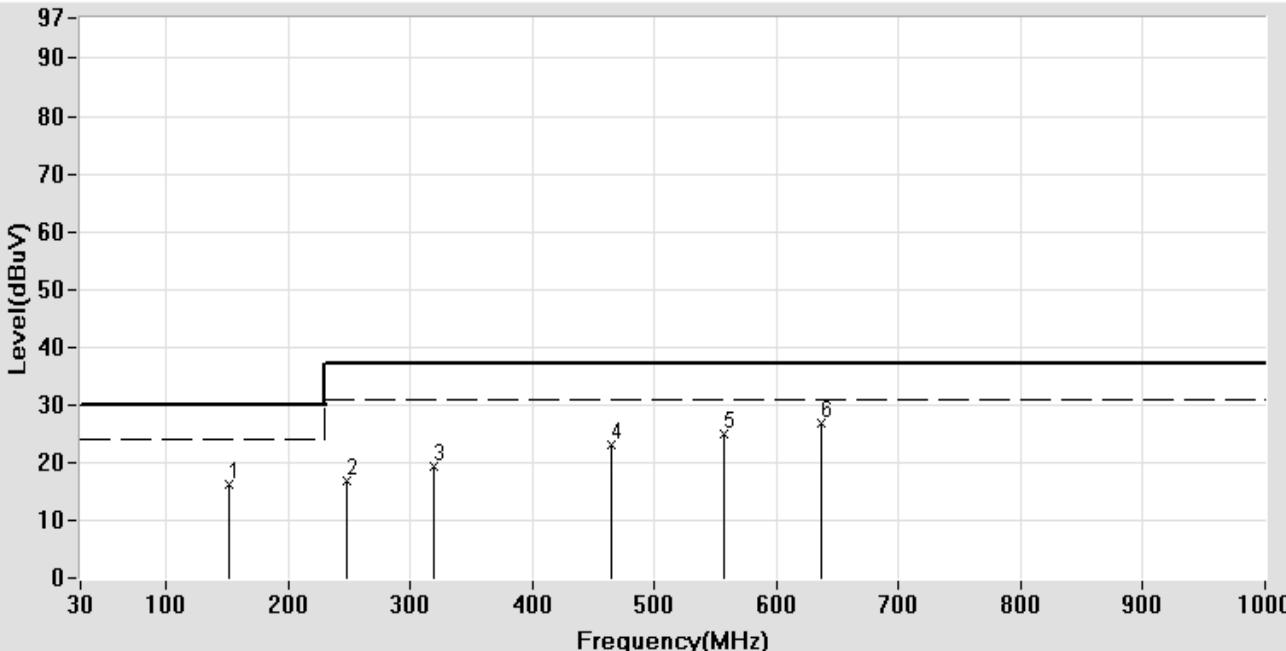
Radiated Emission Measurement Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F1000 RATING: 120V/60Hz Temperature: 25.0 °C Humidity: 57 %			POLARITY: Horizontal DISTANCE: 10 m Serial No.: FILE/DATA#:IRIS.emi/6 OPERATOR: KEN TEST SITE: OAST2		
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
151.790 **	-15.57	29.67	14.10	30.00	-15.90
247.680 **	-11.04	27.91	16.87	37.00	-20.13
265.470 **	-12.21	31.41	19.20	37.00	-17.80
319.998 **	-9.61	29.68	20.07	37.00	-16.93
457.690 **	-6.43	29.02	22.59	37.00	-14.41
557.147 **	-4.17	29.47	25.30	37.00	-11.70
Remark: 1. “*” Mark means readings are Peak Values. 2. “**” Mark means readings are Quasi-Peak values. 3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.					
LIMIT: CISPR22B (10m).LMT					
					
Test Mode: Mode1: Working Mode					

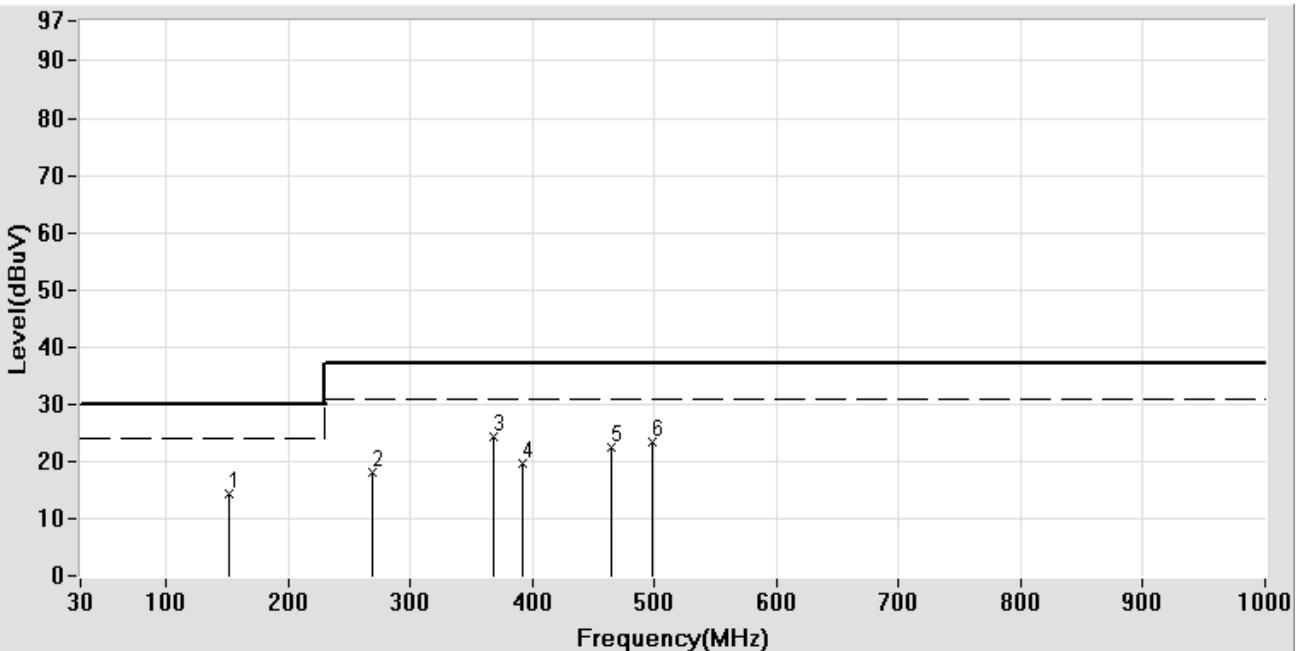
Radiated Emission Measurement Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F1000 RATING: 120V/60Hz Temperature: 25.0 °C Humidity: 57 %			POLARITY: Vertical DISTANCE: 10 m Serial No.: FILE/DATA#:IRIS.emi/5 OPERATOR: KEN TEST SITE: OAST2		
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
125.120 **	-12.94	30.79	17.85	30.00	-12.15
168.460 **	-16.19	24.97	8.78	30.00	-21.22
203.430 **	-15.82	29.67	13.85	30.00	-16.15
247.380 **	-11.70	29.67	17.97	37.00	-19.03
368.940 **	-8.14	32.77	24.63	37.00	-12.37
391.960 **	-8.19	27.40	19.21	37.00	-17.79
Remark: 1. “*” Mark means readings are Peak Values. 2. “**” Mark means readings are Quasi-Peak values. 3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.					
LIMIT: CISPR22B (10m).LMT					
					
Test Mode: Mode1: Working Mode					

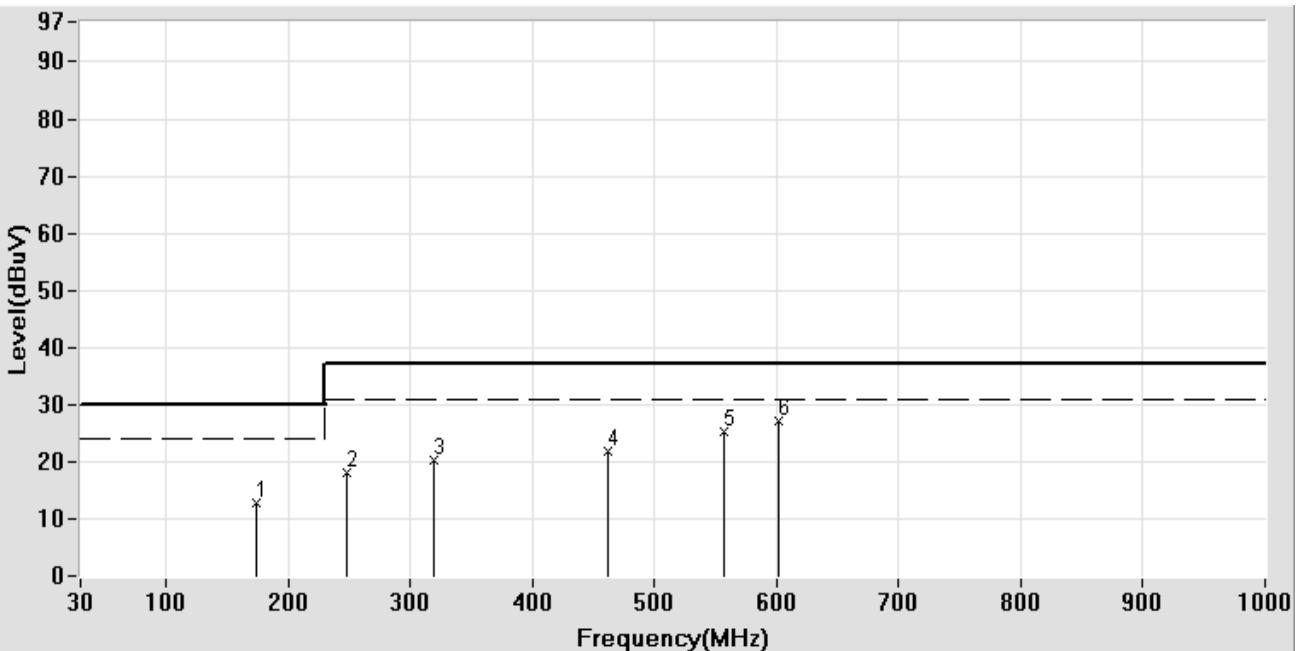
Radiated Emission Measurement Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F800 RATING: 120V/60Hz Temperature: 21.4 °C Humidity: 64 %			POLARITY: Horizontal DISTANCE: 10 m Serial No.: FILE/DATA#:IRIS.emi/8 OPERATOR: KEN TEST SITE: OAST2		
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
151.790 **	-15.57	31.67	16.10	30.00	-13.90
247.680 **	-11.04	28.03	16.99	37.00	-20.01
319.998 **	-9.61	28.87	19.26	37.00	-17.74
464.510 **	-6.30	29.35	23.05	37.00	-13.95
557.147 **	-4.17	29.16	24.99	37.00	-12.01
637.120 **	-3.41	30.17	26.76	37.00	-10.24
Remark: 1. “*” Mark means readings are Peak Values. 2. “**” Mark means readings are Quasi-Peak values. 3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.					
LIMIT: CISPR22B (10m).LMT					
					
Test Mode: Mode1: Working Mode					

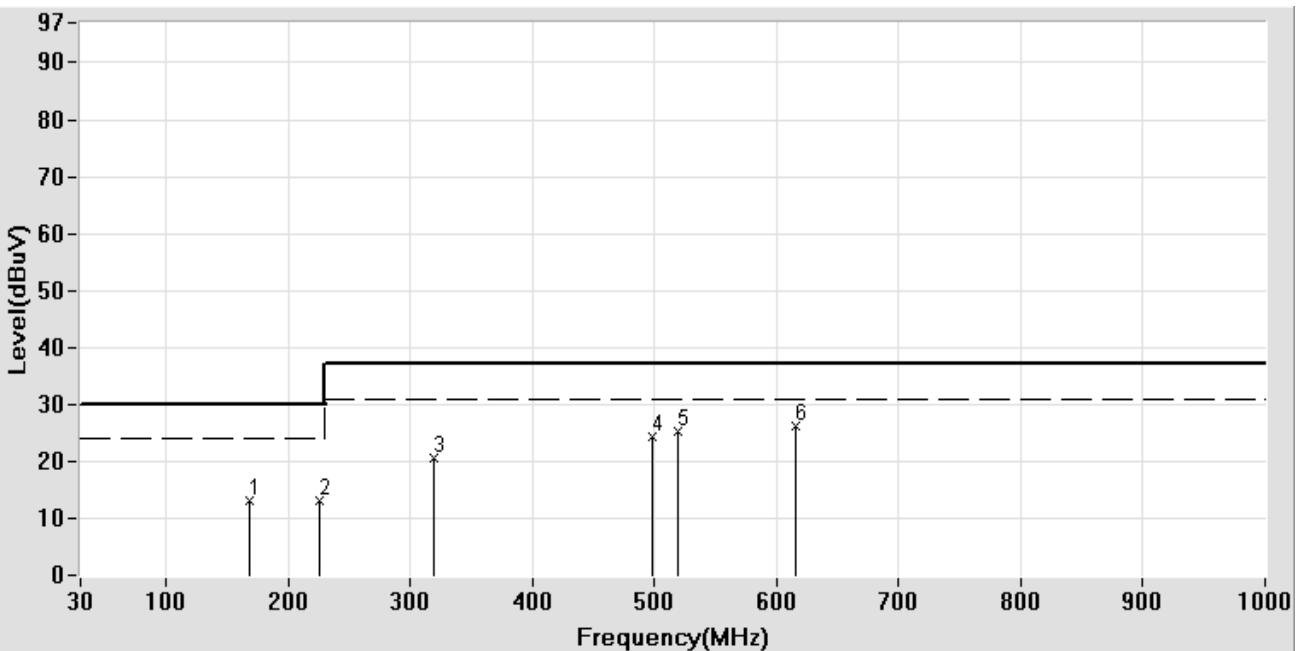
Radiated Emission Measurement Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F800 RATING: 120V/60Hz Temperature: 21.4 °C Humidity: 64 %			POLARITY: Vertical DISTANCE: 10 m Serial No.: FILE/DATA#:IRIS.emi/7 OPERATOR: KEN TEST SITE: OAST2		
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
151.290 **	-15.57	29.80	14.23	30.00	-15.77
268.360 **	-12.12	30.12	18.00	37.00	-19.00
368.940 **	-8.36	32.57	24.21	37.00	-12.79
391.960 **	-7.92	27.54	19.62	37.00	-17.38
464.510 **	-6.30	28.76	22.46	37.00	-14.54
498.230 **	-6.31	29.56	23.25	37.00	-13.75
Remark: 1. “*” Mark means readings are Peak Values. 2. “**” Mark means readings are Quasi-Peak values. 3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.					
LIMIT: CISPR22B (10m).LMT					
					
Test Mode: Mode1: Working Mode					

Radiated Emission Measurement Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F500 RATING: 120V/60Hz Temperature: 21.4 °C Humidity: 64 %			POLARITY: Horizontal DISTANCE: 10 m Serial No.: FILE/DATA#:IRIS.emi/10 OPERATOR: KEN TEST SITE: OAST2		
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
173.290 **	-16.40	29.10	12.70	30.00	-17.30
247.680 **	-11.04	29.12	18.08	37.00	-18.92
319.998 **	-9.61	29.85	20.24	37.00	-16.76
462.220 **	-6.33	28.12	21.79	37.00	-15.21
557.147 **	-4.17	29.33	25.16	37.00	-11.84
602.150 **	-4.82	31.88	27.06	37.00	-9.94
Remark: 1. “*” Mark means readings are Peak Values. 2. “**” Mark means readings are Quasi-Peak values. 3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.					
LIMIT: CISPR22B (10m).LMT					
					
Test Mode: Mode1: Working Mode					

Radiated Emission Measurement Data

EUT: E passport reader CLIENT: IRIS Corporation Berhad MODEL: AXESS F500 RATING: 120V/60Hz Temperature: 21.4 °C Humidity: 64 %			POLARITY: Vertical DISTANCE: 10 m Serial No.: FILE/DATA#:IRIS.emi/9 OPERATOR: KEN TEST SITE: OAST2		
Frequency (MHz)	Factor (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
168.270 **	-16.21	29.34	13.13	30.00	-16.87
225.822 **	-14.18	27.15	12.97	30.00	-17.03
319.998 **	-9.63	30.07	20.44	37.00	-16.56
498.230 **	-6.12	30.43	24.31	37.00	-12.69
518.790 **	-5.69	30.83	25.14	37.00	-11.86
616.170 **	-3.04	29.14	26.10	37.00	-10.90
Remark: 1. “*” Mark means readings are Peak Values. 2. “**” Mark means readings are Quasi-Peak values. 3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.					
LIMIT: CISPR22B (10m).LMT					
					
Test Mode: Mode1: Working Mode					

6 The field strength of EUT emissions within the band 13.553~13.567 MHz

6.1 Instrument (For frequencies measured below 30 MHz)

Instrument	Manufacturer	Model	Serial No.	Last Calibration
Spectrum Analyzer	Agilent	8564EC	4046a00331	2006/03/27
Cable	IETC	CBL07	CBL07	2006/05/09
Loop Antenna	Schaffner	HLA6120	1171	2006/08/01

Note: All instrument upon which need to be calibrated are within calibration period of 1 year.

6.2 Standard Applicable and limit

The radiated emission shall comply with §15.225(a).

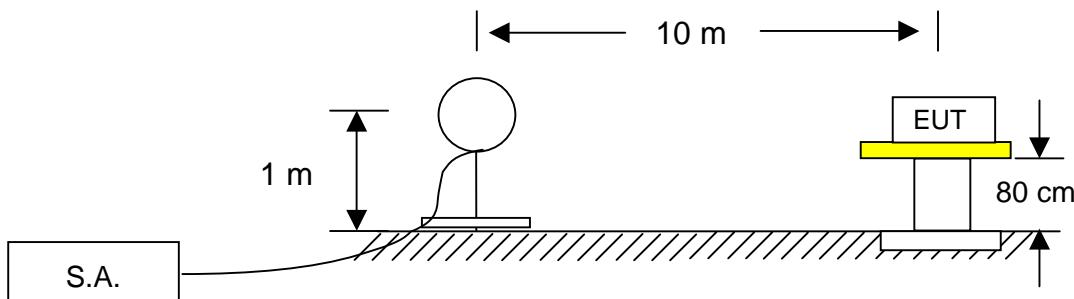
The field strength of EUT emissions within the band 13.553~13.567 MHz

Limit:

Field strength (μ V/m)	Field strength (dB μ V/m)	Distance Meters (m)
15.848	24.00	30
34.933	43.08	10
55.848	64.00	3

6.3 Block Diagram of Test Configuration

Frequencies measured below 30 MHz configuration



6.4 Measurement Instrument setting

- 6.4.1 Set the EMI test receiver frequency range from 9 kHz to 150 kHz.
- 6.4.2 Set the EMI test receiver bandwidth at 100 Hz.
- 6.4.3 Set the EMI test receiver detector as Quasi-Peak (Q.P.).
- 6.4.4 Set the EMI test receiver frequency range from 150 kHz to 30 MHz.
- 6.4.5 Set the EMI test receiver bandwidth at 9 kHz.
- 6.4.6 Set the EMI test receiver detector as Quasi-Peak (Q.P.).

6.5 Configuration of Measurement

6.5.1 The field strength shall be measured for frequencies below 30 MHz. The equipment under test shall be measured at a distance of 10 m on an outdoor test site. The test antenna shall be a calibrated shielded magnetic field antenna.

6.5.2 The equipment under test shall be switched on with normal modulation. The characteristics of the modulation signal used shall be stated on the test report. The measuring receiver shall be tuned over the frequency range 9 kHz to 30 MHz, except for the frequency band on which the transmitter is intended to operate.

6.5.3 At each frequency at which a relevant spurious signal is detected the equipment under test and the test antenna shall be rotated until maximum field strength is indicated on the measuring receiver. This level shall be noted.

6.6 Test Result

Results for the radiated measurements below 30MHz according §15.225(a)

Frequency (MHz)	Level (μ V/m)	Over Limit (μ V/m)	Limit Line (μ V/m) 10m
13.56	2.61	-32.323	34.933

7 The frequency tolerance of the carrier signal

7.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Last Calibration
Spectrum Analyzer	Rohde & Schwarz	FSP30	100002	2006/11/14
Cable	IETC	CBL07	CBL07	2006/05/09

Note: All instrument upon which need to be calibrated are within calibration period of 1 year.

Instrument	Manufacturer	Model	Serial No.	Last Calibration
Temp&Humi Chamber	GIANT FORCE	GTH-150-40-2P-U	MAA0305-012	2005/05/10

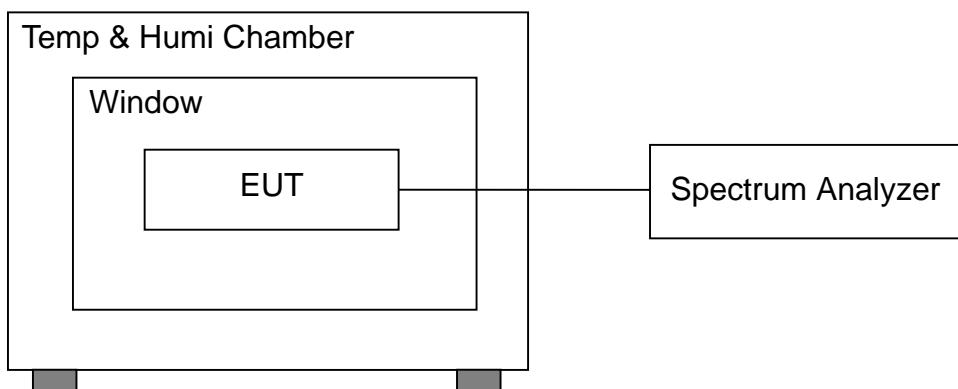
Note: All instrument upon which need to be calibrated are within calibration period of 2 year.

7.2 Standard Applicable and limit

The radiated emission shall comply with §15.225(e).

Frequency tolerance $\pm 0.01\%$ of carrier frequency.

7.3 Block Diagram of Test Configuration



7.4 Measurement Instrument setting

Instrument Parameter	Setting
Frequency Range	13MHz~14MHz
RBW	9kHz
VBW	Auto
Sweep Time	Auto
Attenuation	Auto
Detector	Quasi Peak
Averaging	Off

7.5 Configuration of Measurement

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operate equipment, the equipment tests shall be performed using a new battery.

7.6 Test Result

7.6.1 Frequency tolerance for Temperature variation (13.56MHz)

Temp.	Power voltage	Frequency tolerance					
		2 min		5 min		10 min	
°C	(Vdc)	(MHz)	%	(MHz)	%	(MHz)	%
50	5	13.5596	-0.0029	13.5596	-0.0029	13.5596	-0.0029
40	5	13.5592	-0.0058	13.5596	-0.0029	13.5598	-0.0014
30	5	13.5598	-0.0014	13.5598	-0.0014	13.5596	-0.0029
20	5	13.5596	-0.0029	13.5598	-0.0014	13.5602	0.0029
10	5	13.5598	-0.0014	13.5598	-0.0014	13.5600	0
0	5	13.5596	-0.0029	13.5600	0	13.5598	-0.0014
-10	5	13.5594	-0.0044	13.5592	-0.0058	13.5600	0
-20	5	13.5594	-0.0044	13.5596	-0.0029	13.5598	-0.0014

7.6.2 Frequency tolerance for Voltage variation (13.56MHz)

Temp.	Power voltage	Frequency tolerance					
		2 min		5 min		10 min	
°C	(Vdc)	(MHz)	%	(MHz)	%	(MHz)	%
20	4.25	13.5596	-0.0029	13.5598	-0.0014	13.5602	0.0029
20	5.75	13.5596	-0.0029	13.5598	-0.0014	13.5602	0.0029